Space Weather Forecast

Issued on Sunday, 10 April 2022 at 13:35 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Likely G1/Minor Storm, Chance of G2/Moderate Storm and Slight Chance of G3/Strong Storm on Day 1 (10 Apr). Chance of G1/Minor or G2/Moderate Storm day 4.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with two common class flares from AR2978. There is now one sunspot region on the Earth-facing disc, as AR2978 and AR2981 have both rotated off the southwest limb. The remaining region is small and simple. A large filament in the southwest of the disc lifted off on 9th Apr. The associated CME has been analysed, with the bulk of the ejecta travelling below Earth's orbit, but looks like it may have an Earth directed component.

Solar Wind / Geomagnetic Activity: The solar wind, as measured by DSCOVR at L1, was indicative of weak coronal mass ejection effects and a high speed stream arrival through the overnight period UTC. Wind speeds were initially slow-ambient, gradually rising to elevated by 10/0900 UTC, before settling back to slightly elevated levels by the end of the period. The interplanetary magnetic field strength was Weak initially before soon becoming Moderate, with a Strong interval between 09/2300-10/0400 UTC. The important north-south component, ranged between strongly positive and strongly negative, with the most notable switch to southward direction between 10/0200-0900 UTC. Geomagnetic activity was largely Quiet to Active (Kp 0-4) with two Moderate Geomagnetic Storm intervals (Kp 6) between 0300-0900 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low or Very Low, with only one small and simple sunspot on the disc. There is a Chance for further C-class flares during Day 1 (10 Apr), which will decline as the main region responsible for recent flaring rotates further away from the southwest limb.

Solar Wind / Geomagnetic Activity: Current high speed stream effects may be enhanced by a coronal mass ejection arrival during Day 1 (10 Apr). Timing of this feature is uncertain, but combined effects are expected to dominate during Day 1, slowly starting to ease during Days 2 and 3 (11-12 Apr). A further coronal mass ejection is possible late on Day 3 or early Day 4 (12/13 Apr).

Geomagnetic activity is forecast to be Quiet to Active with G1/Minor Storms likely, a chance of further G2/Moderate Storms and a slight chance of G3/Strong Storm intervals later in Day 1. The risk of G1 will gradually decline through Days 2 and 3, before increasing again later on Day 3 or early Day 4.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	70	40	40	60
Strong	G3	No	10	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	2	1	1	1
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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